

Comparison of subjective and objective measurements with the Sine-Wave Testing Equipment

Subjective: The eye is presented with resolution targets in a clear field, within the eyepiece. The observer determines the highest frequency he can see with a given target modulation which he can vary. By making enough of these target modulation changes, he can acquire enough data points to determine transfer function. This is accomplished by determining the ratio of his cut-off modulation to the input target modulation.

The key here is the observer's cut-off modulation, and will vary from observer to observer, with frequency. His judgements are also affected by the level of illumination during his observations. These two factors are strictly the observer's, and any transfer function determinations therefore include him as part of the data.

Objective: To remove the observer from the measurements it is necessary to hold the intensity of observation constant and to provide a comparison object, in the eyepiece, which holds cut-off frequency of the eye constant, as well as the cutoff modulation. This is accomplished by the sine-wave of low modulation. The observer now adjusts frequency to match the sine-wave, varies input (target) modulation until the sine-wave and target image blend into a plain, flat density region and records his input contrast. Now, everything about the observer is removed; he is being used as a detector whose response is flat over all frequencies of interest. Only the instrument is being tested.

Declass Review by NIMA/DOD